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The Social Capital of Regional Dynamics: A Policy Perspective

Hans Westlund
National Institute for Working Life

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National Institute for Working Life, Studentplan 1, SE-831 40 Östersund, Sweden

ABSTRACT:
This paper deals with social capital as an extra-market externality, and its role for innovations and growth. It analyses the changes of innovation activity over time, from early industrialism to the global knowledge economy, how the relations between the actors of today's innovation systems have developed and the role of social networks for innovations. The different kinds of networks built by the three constructers of social networks: the individual, the organizations and the (public and civic) society are discussed. The role of public policy in building social capital for innovations and growth is analyzed.

1 Introduction

Making something new, improving the quality and characteristics of existing products or producing things more cost efficient are three of the ways in which economic growth is created. Of these three, it is only the last one that can be considered connected to neoclassic theory, in the form of optimum combination of the given production factors under given technology. Changes of technology, as well as the source to the two other ways to create economic growth are not happening through variations in the quantities of factors, but by the setting up of new production functions through different types of *innovations*, or what Schumpeter (1934, 1950) denominated *new combinations of production factors*. In this expression lies also an understanding of the heterogeneity of the concepts of labor and capital and the possibility of combining an infinite number of labors and capitals in an infinite number of combinations. Thus, studying innovations and economic change requires other approaches than those of traditional mainstream economics.

The last decades, a number of such approaches have emerged: *clusters* and *innovation systems* being the most well-known. Even if the approaches often are connected to Marshall's (1880/1920) notion of *industrial districts*, their theoretical base lies outside traditional economics. Also, these alternative approaches are to a large extent lacking the rigorousness of formal theory and can be considered conceptual frameworks still in their early stages of development (Fischer and Fröhlich 2001). However, important contributions to the formalization of these approaches are Krugman (1991, 1995) and Fujita and Thisse (2003).

Within the discipline of economics, the concept mostly connected to the new approaches is that of *externalities*. The concept of externalities dates back to Marshall (1880/1920) and has been considered one of the most intangible and hard-formalized in the economic literature (Scitovsky 1954). Sraffa (1926) considered externalities as the only source of increasing returns under perfect competition. Based on Scitovsky's (1954) division of externalities in pecuniary or technological, Johansson (2004) has made a fundamental distinction between firms' *intra-market* and *extra-market* externalities. Intra-market externalities are mediated through the formation of prices, while extra-market externalities consist of links, agreements, networks and other arrangements of club type, but also information and knowledge spillovers.[1]

The two types of externalities have an impact on different activities of a firm. While, according to Johansson (2004) intra-market externalities affect a firm's transaction costs and productivity, extra-market externalities affect a firm's access to information and knowledge spillovers, i.e. its innovation potential. In both cases, space forms an important restriction implying agglomeration economies. Both intra- and extra-market externalities are distance-sensitive (as most contact-intense activities are) and space forms a restriction for the spatial reach of such externalities as transportation across space is connected with a cost. This paper focuses on the second type of externalities, the extra-market externalities, and how they contribute to the emergence of new combinations of production factors in a regional context. More precisely, it investigates the role of social capital for regional dynamics and what role policies can play in these processes.

Social capital is here defined as *social, non-formalized networks that are used by the networks' nodes/actors to distribute norms, values, preferences and other social attributes and characteristics*. An important feature of this definition is that it distinguishes between the networks and the norms, etc that are distributed in the networks. Social capital can be seen as a type of infrastructure with nodes and links. The nodes consist of individuals and organizations, which

[1] Information and knowledge spillovers are by Fujita and Thisse (2002) denominated communication externalities.

establish links between each other. The creation of links is governed by the individuals' and/or organizations' norms, preferences and attitudes, which can prevent emergence of links between individuals or organizations as well. In the links, different types of information and knowledge are distributed between the nodes. From an infrastructure perspective, this distribution of information and knowledge can be compared with traffic in the transport infrastructure. The impact of social capital on society depends on both its quality and quantity. The norms, preferences and attitudes of the nodes, and thereby the kind of information and knowledge being distributed in the links, are at least as important as the number of links. "Strong" social capital can thus have preservative as well as progressive effects, depending on its qualitative characteristics.[2]

A starting point for this paper is that it is necessary to distinguish between a general, social capital on societal level and social capitals specified for the needs of organizations (groups, firms, public sector bodies). In the latter case, social capital has characteristics of sunk costs, i.e. that it often cannot be used for other purposes than it was formed for and that it might become useless or even detrimental when the organization changes its activities. Analogous with this, we can make a distinction between public social networks, which in principle everyone with certain skills have access to, and private networks, formally or informally controlled by certain groups.

Section 2 analyses the changes of innovation activity over time, from early industrialism to the global knowledge economy, how the relations between the actors of today's innovation systems have developed and the role of social networks for innovations. Section 3 discusses the different kinds of networks built by the three constructers of social networks: the individual, the organizations and the (public and civic) society. Section 4 analyses the role of public policy in building social capital for innovations and growth. Section 5 contains some concluding remarks and suggestions for future research.

2 Innovations and Social Capital

2.1 New and Old Concepts

A number of concepts have been formulated to describe and analyze the proximity- or link-based interaction between individual firms and other actors producing externalities. *Industrial districts* – the term coined already by Marshall – are normally defined as spatial agglomerations of SMEs in one or a few complementary industries (Paniccia 2002). In particular, the term has been used for agglomerations of SMEs in Italy. *Cluster*, a concept with a number of slightly different interpretations, has received, through Michael Porter's book *The Competitive Advantage of Nations* (1990), an enormous amount of attention in both research and policy circles. Clusters are often defined as spatially delimited industrial systems regardless of the size of the enterprises (Paniccia 2002), but it should be noted that Porter (1990) has also considered clusters as being functional industrial systems without a proximity dimension (Malmberg 2002). Another ambiguity is that much of the cluster literature, based on Porter (1990) treats clusters as purely a spatial concentration of related firms (see e.g. Enright 1998), while Porter later (1998, 2000) explicitly includes public institutions, such as government educational institutions and support services, in the definition of clusters. The vast popularity of the concept, not least in industrial policies, has resulted in "cluster" becoming become a possible denomination of almost any agglomeration of economic activity. Even if clusters are thus sometimes regarded as consisting of firms as well as public institutions, both the cluster and the industrial district approach have their main focus on inter-firm relations.

[2] See Westlund (2004) for a more extended discussion.

While the terms industrial districts and clusters have mainly been used for local and regional relations between firms, the concept of *innovation systems* was originally formulated for systems at a *national* level and denoted not only inter-firm relations but also links between firms and government, firms and research institutions or between all three of them. It was used for the first time by Freeman (1987) in his analysis of the economic development of Japan after World War II, where government, especially the Ministry of Industry and Trade (MITI) played a crucial role. Leading scholars of this tradition (Lundwall 1992; Nelson 1993) have regarded the nation as the evident level of analysis as "… the policies and programs of national government, the laws of a nation, and the existence of a common language and shared culture define an inside and outside that can broadly affect how technical advance proceeds" (Nelson 1993 p. 16).

In the last decade the concept of *regional* innovation systems (RIS) has yielded a rapidly increasing literature (see e.g. Cooke 1992, 2001 and 2003; De la Mothe and Paquet 1998; Asheim and Gertler 2004; Doloreux and Parto 2004, etc). The regional approach on innovation systems is according to Doloreux and Parto (2004) a normative and descriptive approach, which is based on two main bodies. The first is the national innovation systems approach, based on evolutionary, non-equilibrium theories and in which innovation is a result of processes both internal and external to the firm. These processes are not only technical and economic but also social. *Learning*, through interaction, is a key concept in the innovation processes. The second body of literature is that of regional milieu, embeddedness and the role of proximity. According to its analysts the concept of regional innovation systems has increasingly become an all-embracing term for firms' interaction with each other and other actors at regional level.

A fourth concept, strongly linked to the abovementioned is that of *triple helix*, which "… is a spiral model of innovation that captures multiple reciprocal relationships at different points in the process of knowledge capitalization… … The triple helix denotes the university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres which overlap and take the role of the other." (Etzcowitz 2002 p. 2). It is no coincidence that university is the actor named first. According to Etzcowitz, an important difference between the innovation system and triple helix approaches is that the former has its focus on the firm and views innovation as primarily occurring within the firm. In contrast, the view of the triple helix approach is that "Innovation is increasingly likely to come from outside of the individual firm or even from another institutional sphere such as the university…" (Etzcowitz 2002 p. 1). Triple helix processes are possible at regional, national as well as multi-national level.

The four approaches, very briefly summed up above, have one thing clearly in common: the focus on *interaction* where firms are involved. Apart from that, the approaches show differences between each other but also between different interpretations of the same approach, when it concerns e.g. spatial level, included actors, their size and sectoral scope. The industrial district approach is the most limited as it only comprises interaction at local level between SMEs in one or a few closely related industries. The different interpretations of clusters – from pure industrial districts with only firms involved, to non-spatial, sectoral systems of innovation with several types of actors – is an illustration of the concept's popularity, but also of the concept's weakness as an analytical tool (cf. Marcusen 1999). Similar criticism has been raised against the regional innovation systems concept (Doloreux and Parto 2004), which, as shown, has also been considered as a still wider concept than the cluster. Finally, the triple helix approach is a more delimited normative approach which not only states that three types of actors *should* interact but also that their activities partly *overlap*. Moreover, triple helix' prime focus is not on the firm's knowledge input and innovation process but on the interaction as such and how it transforms the actors.

Although not always explicitly expressed, the four approaches also have something else in common, namely their acknowledgment of externalities in the form of *transfer of (tacit) knowledge* or *knowledge spillovers, emergence of new knowledge* and *(collective) learning* as a primary outcome of the interaction. It is in these knowledge creating and transfer processes that social capital constitutes a ubiquitous but multifaceted factor. The "right" social capital facilitates or even

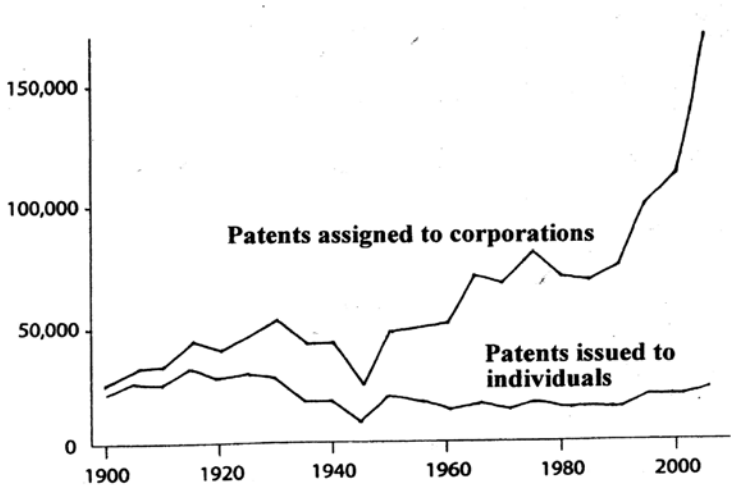
spurs these spillovers, learning and innovation processes, whereas "wrong" social capital is like sand in a complicated machinery.

2.2 From the Lonely Genius to Innovation Nodes

The theories of (national and regional) innovation systems, clusters, industrial districts and triple helix have in common the focus on interaction between a number of key actors. The industrial district approach, as well as certain of the many cluster approaches, concentrate on solely firms' interaction, while other cluster approaches, the innovation systems approaches and the triple helix approach underline the interaction between at least two of, but often the three key actors of innovation: companies, public sector bodies and universities. However, this view of innovation, as a result of interaction of actors with different tasks and different principles of production and exchange (see below), is a relatively new standpoint. Historically, innovation activities seem to have had quite other characteristics than the complex systems of today.

The history of technology and economic applications of technology is full of examples of individual inventors that came up with path-breaking prototypes and methods, which rapidly were commercialized into successful products. Even if we perhaps can find some examples of lonely great geniuses in the computer industry, there is no doubt that the individual inventor belonged to a certain economic era; an early industrial era that lasted until about World War I. Most of the world-leading corporations of today stem from that era – an era where a single innovator could build up a company from a prototype or a method.

Figure 1. Patenting in the United States 1900-2001



Source: Suarez-Villa (2004); U.S. Patent and Trademark Office.

The interwar years can be viewed as a transition period from "individual inventor capitalism" to "corporate innovation capitalism". Figure 1 shows that albeit the gap between patents assigned to corporations and patents assigned to individuals in the U.S. increased slowly after 1900, the former increased rapidly after 1945, while the number of patents issued to individual remained practically constant the rest of the century. After World War II innovation activities seems to have entered a new stage. With a larger public sector after the war and raised demand for, among others, military

security and transportation infrastructure, governments of the developed world began to act as a qualified customer of private corporations. The most far-reaching example of this is probably what was denominated the space- and military industrial complex in the U.S. which had its counterparts in other countries.

Some Swedish examples of this symbiosis between government and state-owned companies on the one hand and private companies on the other are: Vattenfall (hydroelectricity) and Asea (today ABB, generators and other electrical equipment); Televerket (former state telephone monopoly, now TeliaSonera) and Ericsson (switchboards and other telephone equipment); the state railways and Asea (engines) and the air force and SAAB (combat aircrafts). The common denominator in these so called "development couples" was a state monopoly (complete or partial) that through its safe position could make long-term, costly R&D investment and act as qualified customer for the (at that time Swedish-owned) private companies (Sörlin and Törnqvist 2000).

Another example of intimate collaboration between government and private companies is the Japanese system after World War II; the system of collaboration for which the concept of innovation system was coined. Freeman (1987) noted important differences between the Japanese national system of innovation and industrial policies in other countries. Like Johnson (1982) and Lakshmanan (1994) he stressed the role of MITI, the Ministry of industry and trade, in identifying strategic future key technologies and actively promoting company R&D in theses technologies.

Even if there were important differences between the American, the Swedish and the Japanese innovation systems during this period, they had in common the intimate cooperation between government and industry in certain key technologies. Government was a qualified customer with strong resources for R&D, which was performed in cooperation with private companies. Only certain, special fields of university research were involved in this cooperation. The innovation systems of late industrialism were mainly a system with two actors: government and private companies.

The industrial crisis of the 1970s can also be considered a crisis for "corporate innovation capitalism". According to Figure 1, the number of patents assigned to corporations in the U.S. diminished between 1975 and 1990. Thereafter, a still much sharper increase in the number of corporations' patents took place. It is possible to interpret this "patent explosion" as a new stage of innovation activity, connected to the theories of knowledge society (Andersson and Strömquist 1988, Andersson 2000), Mode-2 society (Gibbons et. al. 1994, Nowotny et. al. 2001) and triple helix (Etzcowitz and Leydesdorff 1996). In spite of different perspectives and focuses, the three theories have in common a stress of the new role of knowledge and knowledge-producing organizations in society.[3] Knowledge has been transformed from one of several resources in production to "the predominant part in the creation of wealth (…) in all manner of economic activity" (DTI 1998). While the main value of the typical manufacturing firm resided in its physical capital, the value of a knowledge intense firm is in its intellectual property. Whereas the manufacturing firm sells tangible products for consumption or refinement, the knowledge intense firm's products consist of R&D products, including patents, with a *potential* for being commercialized and profitable. Innovations, defined as new combinations of production factors has become the core of knowledge society.

However, the innovation activities of the knowledge society differ fundamentally from those of the early industrial period. Innovation activity in the knowledge society is a collective process in which people and organizations have to cooperate. This is the circumstance brought up in the "macro" theories of innovation systems with three actors and that of triple helix.

On micro level, innovation activity in the knowledge society seems to require a permanent flow of new information and knowledge, which in practice means a flow and exchange of people in the

[3] Here it should be noted that we in line with North (1990) make a distinction between organizations (firms, governmental organizations, universities and NGO:s) and institutions (laws and regulations, formal and informal rules of the game).

innumerable innovation processes of everyday (see e.g. Kobayashi and Takebayashi 2000). As has been pointed out by many scholars this gives the great cities a special role as knowledge and innovation nodes. Their size creates a diversity that makes specialized supply and demand – and new combinations of both categories – possible. This means that the knowledge economy not only creates another type of innovation than the late industrial society. It also changes the spatial allocation of production factors. As the great cities become centers for the increasingly important production factor human capital, they also emerge as stabilizing factors in the global economy where knowledge is foot-loose but human beings and the organizations of knowledge are much more rooted. To partly quote Markusen (1996), the great cities are sticky, innovation nodes in a space where information and knowledge "slip" around.

2.3 Why care about social links?

From what is said above is seems as innovation over time has become an increasingly complex process. It is an exaggeration to say that innovation in the early industrial period only was a process of merging technology and capital in the form of providing the innovator with financial resources to start production. Access to capital, finding the right customer and getting the innovation accepted was essential also in the 19th century.[4] However, in the knowledge society, innovation activities can be divided in a large number of stages from basic research, via e.g. development, testing, licensing, marketing and sales to final use, each of them requiring a certain partner for e.g. financing. One way to express the differences between innovation activities in the two periods is to say that they differ substantially in the number of actors involved, in the number of links between them, and in the amount of knowledge and information being distributed between the actors.

The emergence of spatial clusters and regional innovation systems can be viewed as an expression of the intra- and extra-market externalities and their distance-dependency. Following Johansson (2004) we can assume that knowledge transfers take place through two types of processes:

1. Deliberate, formalized transaction-links, agreements, networks and other club-like arrangements between firms and firms and other actors, and
2. Unintended knowledge spillovers between firms or between firms and other actors, caused by non-formalized interactions. These kinds of interactions consist of: a) vertical technical/economic interactions between firms and their suppliers and/or customers, b) spin-offs of new firms from existing ones and turnover and exchange on the labor market, c) horizontal interaction in the form of informal exchange of information and knowledge in the (local/regional) civil society, between individuals connected to firms or other actors.

In both these two types of processes, social links and the norms and values connected to them play an important role. The reason is simply that *good social relations facilitate knowledge transfers while lack of relations or bad relations does not.*

Regions have different prerequisites to deal with this circumstance. Diversified metropolitan regions consist of a number of co-located sectoral clusters that often do not have more in common than the use of the regional infrastructures and certain regional markets. Apart from that, each cluster have their own links, those external to the firm but internal to the cluster, and those between the clustered firms and the rest of the world. The relations of each cluster are formed in accordance with the stages of innovation, types of production, positions in the product life cycles, etc. In this

[4] The problems with getting an innovation accepted can be exemplified with John Ericsson's steam fire-engine, which when it was successfully demonstrated in London 1829 caused such an anxiety in "The London Fire Brigade", practically a guild with monopoly on fire-fighting, that it was rejected by the committee in charge (Goldkuhl 1961).

way a metropolitan region can accommodate competitive clusters in both expanding and declining sectors.

If small regions contain any clusters, it is with few exceptions only one cluster. Regardless of the sector of the cluster – expanding or declining – the small regions' development is highly dependent on the quality of the cluster's social relations. Well functioning internal and external social relations facilitate acquiring of knowledge and information about e.g. changes in demand, new methods, etc, as well as credits. Smaller regions, being dependent on one cluster are in general more vulnerable and more dependent on good relations between all relevant regional actors.[5]

Who are these actors that build and maintain this essential social capital? This question is dealt with in the next section.

3. Social Capital on Three Levels

The theories of innovation systems and triple helix concentrate on the interplay between different types of *organizations*. However, organizations represent only one of three levels in which social capital can be analyzed. *Individuals* build organizations and together those levels form a *society*. This section discusses the social capitals built by the actors on the three levels and how these social capitals are based on the fundamental needs and aims of these actors.

3.1 Organizations and their social capital

As analyses of and policies for innovations primarily are focused on organizations it might be appropriate to start the discussion on this level. According to the policies based on modern innovation theories, the three types of organizations – firms, universities and government – should cooperate in order to meet the needs of the knowledge economy. Universities should provide the knowledge, government provides favorable institutions and development resources and firms provide resources and know-how for commercialization. However, a dilemma is that the three actor blocs are based on different principles of exchange, which are reflected in different rules of the game. Following Polanyi (1944) it can be argued that a firm bases its activities on a market principle where profit is a necessary ingredient. For public government, which has the power to collect individuals' and organizations' resources and redistribute them, the basic principle is redistribution. The third type of organization, the academy (or university), is for its part historically predominated by a third principle, viz. reciprocity – a mutual exchange of knowledge and ideas. Academy-produced knowledge is by tradition neither sold on a market nor taken from one actor and given to another, but exchanged and valued by equals (peers) without any losses.

It goes without saying that organizations with such principal differences build social capital with very dissimilar networks, which connect different types of actors and are based on different norms and attitudes. The activities of the firm are executed with the aim of making profit. The firm builds technical and economic links internally and to external actors. These links are established and maintained if they are assessed to bring net revenues. The social networks of a firm are based on more compound motives. Creation and maintenance of social links that the firm makes deliberate investment in – e.g. corporate culture, personal customer relations, etc – are in principle controlled

[5] In a study of determinants of economic growth in the Swedish municipalities, Eliasson, Westlund and Fölster (2004) found that the importance of business-related social capital decreased with municipality size.

by the same net revenue principle as economic links.[6] But many social networks are unintended by-products of other interactions (Putnam 1993). Thus, many social links of the firm are by-products of its economic networks. To the extent to which human beings are involved, social links/relations develop as a consequence of the economic links. Consequently, a firm makes certain deliberate investment in social networks, but many of the social networks of a firm are by-products of technical and economic networks.

Accordingly, companies' social networks have two sources: Deliberate, formal investment decisions by management on different levels, in accordance with the firm's basic mission, and spontaneous, informal investment decisions by individuals, originally connected through the economic links, based on a volition to interact, to socialize. The volition to interact is connected to the "affinity" – here defined as attraction, liking or feeling of kinship – between the actors (cf. Johansson and Westin 1994). For a social link to be established, the nodes/actors should have something in common (e.g. some norms, values or preferences, cultural similarities, or some minimum degree of mutual trust). Moreover, economic interaction can to some extent be governed by the ease of formation of social capital between actors. Rauch (1996, 1999, 2001) has underlined the role of social capital and networks for international trade and e.g. shown the significant impact of common language/colonial ties on trade between countries.

The second type of organization, public government, is run by political objectives, but a fundamental need for public government is to legitimize itself. For this reason it builds social links to the citizens and organizations of society, beside the necessary economic and technical networks it needs to fulfill its objectives. As in the case of the firm, public government's activities also create "uncontrolled" social networks as by-products. However, as the basic mission of public government is to redistribute the resources of society, both the intended and unintended social networks of government, and the norms and values distributed in them, fulfill other objectives than the social networks of the firm.

The third type of organization is the academy. In spite of the fact that it is financed in a number of different ways, it has an international, joint identity with missions, objectives and norms. This academy-internal social capital is an important reason behind the academy's relative independence vis-à-vis other actors in society. It is on the other hand a potential obstacle to collaboration with organizations having other missions and social capitals.

These three types of organizations build social capitals deliberately and contribute to unintended, spontaneous social capital-building as well. Figure 2 describes the different component parts of organizations' social capital. Depending on the organization's mission, certain norms, values and attitudes are developed, which in their turn govern the extension and allocation of the organization's internal and external links.

Analogous to the increased complexity of innovation activities over time, discussed in section 2, it can be argued that organizations' social capitals have become more and more complex. The assembly line – the archetypical symbol for manufacturing industrialism – required few social skills of its workers, not even a common language. In contrast, work in a consultancy company of today requires ability to cooperate, build networks and even certain attitudes. People without this social competence do not get access to the social capital of these companies of the knowledge economy.

In the period when public government was small, it was held together by a strong social capital, expressed in the ideology of the public official, standing above the interest groups of society. The increased involvement of government in different areas of society has made its mission much more complex and consequently also the economic, technical and social networks of government and the values distributed within the social networks have become more composite. The same can be said

[6] However, according to modern managerial theory of the firm, managers might have personal goals that include other things than profits, i.e. managers might benefit from social capital independently of their firms' profits.

about the academy. As long as the university employed a small elite of researchers and students, it was easy to keep its identity, values and networks. With increased resources and increased demands from the resource-providers, university's tasks have multiplied, as have its networks.

Figure 2. Social capital of organizations broken down into different component parts.

Organization-internal social capital	The organization's external social capital		
Links/relations filled with attitudes, norms, traditions etc. that are expressed in the form of: - Internal "spirit" - Climate for cooperation - Methods for codifying knowledge, product development, conflict resolution, etc.	Activity-related	Environment-related	Market-related
	Links/relations to suppliers, customers, clients, partners in cooperation and development	Links/relations to the local/regional environment, to organizations of the two other types, (non-activity-related links to) other organizations of the same type	General relations to the anonymous mass of (actual and potential) customers and clients, built through marketing, customer/client clubs, programs, etc. and expressed in e.g. trademarks.

Thus, the fact that the three types of organizations discussed are based on different missions result in different social capitals. These social capitals are an outcome of both intended and unintended investment. Over time, along with the development from industrial society to knowledge society, the social capitals of organizations have become more complex. Without considering the different missions and the differences in social capital of the three types of organizations modern innovation policies prescribe that they should interact and create innovations. The problem is described in Figure 3. The traditional activities of the types of organizations are market with an O. The consequence of innovation policies is that actors of the three organizational types partly should expand their activities to the fields traditionally upheld by the other types of actors. A successful fulfillment of these expectations demands new strategies for combining the organization's core activity, O, with the new activities (o) that it with few exceptions not has been involved with previously.

Figure 3. The traditional activity of the three types of organization, O, and the activities expected by modern innovation policies (o).

	Type of organization		
Activity	University	Government	Firm
Education & Research	O	(o)	(o)
Public infrastructure and service	(o)	O	(o)
Product development and production for profit	(o)	(o)	O

The theories behind the modern innovation policies are most likely based on empirical observations of a certain expansion of the organizations' activities outside their traditional fields. There is e.g. some evidence that government in many countries is acting less redistributional and more growth oriented. Universities are increasingly facing a situation where they either have to cut down or act more entrepreneurial. As the knowledge economy expands companies get stronger

incentives to collaborate with universities. However, the traditional norms, values and networks, i.e. the existing social capitals of each of the type of organization, are formed in accordance with their traditional activity and not changed from one year to another. Thereby, the established social capitals of the organizations constitute intangible obstacles to the implementation of the modern innovation policies.

3.2 Social Capital of the Individual

The needs of an individual are others than those of an organization. A primary need of a human being is some form of safety. This affects many of acts: work is not only an activity for a pay but also something that through colleagues contribute to a high degree to social safety; on leisure time people socialize with friends, raise a family, etc. In short: individuals construct every day a social capital with relatives, friends and workmates. Relations are built; values and norms are formed to create the necessary stability and safety in a world of uncertainty.

The social capital formed by individuals at their workplace falls under the category of spontaneously created organizational social capital. This social capital is not controlled by the organization, but as it is build on workplace relations it has, in varying degree a (positive or negative) impact on the organization's innovation potential.

From the traditional view of economics, it is harder to find any arguments for the impact on innovations of the social capital individuals build on their leisure time. By definition, working time is production but leisure time is consumption and for that reason there are more reasons to expect innovations happening on working time. However, as was stated in the introduction to this paper, traditional economics may not be the best tool for analyzing innovations and economic transformation. Moreover, it can be hypothesized that the sharp dichotomy between production time and consumption time (work and leisure) of the industrial economy increasingly is being dissolved in the knowledge economy. Informal discussions, information exchange, evaluations, negotiations, etc, connected to production activities are going on during peoples' leisure time. This would mean that individuals' social activities during their leisure time contribute to the forming of a *place surplus* (Bolton 2002, Westlund and Bolton 2003) which indirectly may have an impact on the development on innovations, their commercialization and diffusion.

Concerning the individual's social capital, we also should note that some of the social capitals created by groups of individuals indeed are destructive for innovations and growth. One obvious example is the social capital of individuals in criminal gangs. Another example is what sometimes is called "unemployment cultures" in deindustrialized or low developed areas. Both are examples of social capitals that have emerged from fundamental needs of safety and which in the given situation are experienced as positive for the concerned individuals – without contributing to positive innovations or economic growth.

3.3 Society's social capital

We have established that social capital is built by organizations and individuals, i.e. units with some kind of autonomous decision power. In organizations, also public government is included. However, society in its general meaning, consisting of all individuals and organizations, has no decision power of its own. In what sense is it then possible to talk about *society's* social capital?

The answer is that society's social capital can be described as the lowest common denominator of all the networks, norms and values existing among all individuals and organizations in society. Thus, a society with many separate networks and few common norms and values can be characterized as a very heterogeneous society with a "weak" social capital, while a society with few and overlapping networks and many common norms and values can be characterized as a very

homogeneous society with a “strong” social capital. But – it is not necessarily so that “weak” always is “bad” and “strong” always is “good”.

One example of a strong social capital on societal level is the Swedish “local industrial community spirit” (*bruksanda*) which characterized small and mid-sized places with one dominant manufacturing industry during the industrial epoch. A spirit of common interest, formed through demands and counter-demands, resulted in the local factory taking responsibility for the welfare of their employees and their families in exchange for the loyalty of the families to the local factory. Other enterprises, apart from the necessary local service businesses, were potential competitors for the labor force and were regarded as unnecessary. As a consequence, entrepreneurship and establishment of new enterprises were not supported by the norms and values of the local industrial community spirit. The factory and the workers opposed consciously or subconsciously the emergence of new economic actors. During Sweden’s late industrial era, the local industrial community spirit was a local expression of the ideology behind the successful Swedish Model of stable growth and national understanding. On the other hand, during the structural adjustment since the 1970s, this spirit has been a critical problem for these communities. When the context changed, the communities needed actors to renew both the local industry structure and the local social capital. However, to a large extent, the local industrial community spirit has blocked the emergence of such renewers.

The Swedish Model, of which *bruksandan* was one component part, had its great days from the 1930’s to the 1960’s. Since then, Sweden has become globalized and the knowledge society has replaced the manufacturing-industrial society. Sweden has also become much more diversified in a number of respects, not least concerning lifestyles. This means a huge new formation and inflow of social capital, among youth, immigrants, people in new professions, etc. In this respect, there is certainly no shortage of social capital in Sweden. However, on societal level, be it a city, region of the whole nation, the social capital is “weakened”, with less common denominators than during the days of the Swedish Model.

This conclusion is well in line with Putnam’s (2000, 2001) results that the social capital in the U.S. – and probably also other parts of the developed world – is “weakened”. But Putnam’s measurements of social capital in the U.S. are *per se* a good reason to question his earlier claims (Putnam 1993) of a general correlation between social capital on societal level and economic development. In spite of several decades of weakened social capital (in Putnam’s measures), the U.S. experienced a remarkably strong economic growth in the 1990s (when the knowledge economy expanded) – a circumstance that stands in complete contrast to what Putnam (1993) found in his study of Italy up to the 1970s (i.e. the industrial epoch). The reason is probably that Putnam’s measures of social capital are focused on the *homogeneity* of society. Measured in this way, the American regions that in the 1990s scored highest were homogeneous, stagnating, depopulation regions with limited immigration the last generations. Consequently, expanding metropolises like Los Angeles showed a very low social capital in his measures.

A reasonable hypothesis could be that the homogeneous social capital that Putnam (1993, 2000) focuses on, in general stood in a positive, mutual, self-reinforcing relationship with economic growth during the late industrial period, which in most developed countries lasted up to the 1970s but in e.g. Japan lasted until about 1990. During this period, economic growth was built on mass production based on improvement of old innovations through increased capital intensity of production, without any need for new, path-breaking innovations. The decline of industrial society and emergence of knowledge society has changed these conditions dramatically. Computerization and other applications of digital technology have together with other emerging technologies brought innovations back as an essential ingredient for growth. In other words: new combinations of production factors have once again emerged as important – and a social capital that facilitates and promotes these new combinations is needed. In this way, the formation of social capital, the forces for continuity and for change of the content of social capital are processes that evolve in response to changing societal conditions.

It can be assumed that the quantity of "new combinations" is dependent on the quantity and quality of production factors, including the bearers of human capital. This would mean that societies with a certain grade of diversity would promote new combinations. A social capital of certain degree of *heterogeneity* would in that case be best suited for the current stage of knowledge society. As metropolitan regions often are the most diversified, this can explain why they normally are the centers of growth in the knowledge economy. However, diversity without coherent forces would end up in anarchy. Other characteristics, such as mutual tolerance, are needed to utilize diversity. This line of reasoning corresponds to that of Florida (2002, 2005).

Albeit Florida (2002, 2005) avoids using the term social capital – in order to distance himself from Putnam (1993, 2000) – Florida's contributions center on the role of social norms and values, the networks that are based on them and their impact on regional dynamics. However, Putnam's and Florida's theories on the homogeneous social capital's and on the diversity and tolerance's importance for regions' growth, respectively, have in common that a large number of links in the cause-and-effect-chain are only assumed but not investigated. Moreover, a weakness in both Putnam's and Florida's hypotheses is that they only deal with the social capital of civil society. The social networks and norms of companies and the other actors of clusters and innovation systems are remarkably absent in their hypotheses.

4 Public Policies for Economic and Social Innovations

4.1 Policies on Different Spatial Levels

In Section 2, innovations were treated solely from an economic perspective. However, analogous to Chatterjee and Lakshmanan's contribution to this volume where they distinguish between economic, social and political entrepreneurship, we can also make a difference between economic, social and political innovations. In the remainder of this paper we deal with the first two of these types of innovation economic and social.

In the former section, three sources of social capital were discerned: the individuals, the organizations and society. If social capital has come to play an increasingly important role for innovations as the innovation system have become more complex, there are obvious reasons to ask what public policies can do to contribute to forming social capitals with so advantageous characteristics as possible for innovations and growth.

Starting with the social capital of individuals, it can be argued that the individual as member of a family, neighborhood and leisure clubs in general gets connected to and forms his/her own links to get connected to social networks in accordance with his/her basic preferences. From the perspective of innovations and growth there are often no motives for public policies improving the social capital of individuals. However, there are many examples of social networks and values that diminish the potential for innovations and growth. Networks based on ethnicity, religion, neighborhood, etc. may on the one hand act as critical support structures for its members' economic activities. Businesses based on ethnicity can often exploit certain niches and have often low transaction costs. On the other hand, these networks with their particular norms and values may simultaneously lead to lock-ins in low-productive activities and non-efficient utilizing of resources. Thus, there may be good arguments for policies aiming at creating new links, improving access for individuals in certain groups, to new networks.

When it comes to organizations, we have already shown that organizations are the prime builders and maintainers of their own social capital. Concerning public sector organizations' social capital, it is self-evident that it is governed by public policies. Regarding the social capital of firms

and other organizations independent of government, the influence of public policies is much smaller, but laws and regulations affect the activities of organizations, their social capital-building included.

From the perspective of innovations and growth, what would be the motives for public policies aimed at influencing organizations' social capital? The answer lies in the increased complexity of innovation processes, discussed above. Innovation is no longer dependent of only combination of production *factors* but also of *actors*. The role of policies is in this respect in general terms to facilitate actors' interaction – individuals' and organizations' interaction with government included. The question is just: how?

On national level, the role of governmental policies is mainly indirect. Government can establish good relations with national organizations and leading individuals; change and adapt laws, regulations and taxes; create platforms and gather actors, etc., thereby contributing to improvements of the "innovation climate". More direct effects on innovations might come out of direct initiatives and projects with selected actors.[7] On the other hand, such direct initiatives from above have a higher risk for failure, due to lack of information and (tacit) knowledge, possessed by other actors.

On regional and local level, government can play a much more direct role in getting the actors of innovation together and promoting good relations between them, i.e. to "create" and support clusters. However, a problem is that the leading actors of today not necessarily are those of tomorrow. Companies that have their expansion phase behind them might also have their most innovative phase behind them. The same holds for established, large organizations. Thus, governmental innovation policies on regional and local levels might easily become a victim of path dependencies and promote a social capital that opposes new innovations. Although Schumpeter did not use the concept of path dependencies, he was clearly aware of the problem when he described the problem of social environment's dislike of changes which might go as far as "… social ostracism and finally to physical prevention or to direct attack." (Schumpeter, 1934, pp. 87).

Schumpeter's arguments were of course based on the fact that innovations often bring *creative destruction* that strikes certain actors. This circumstance makes governmental innovation policies on regional and local level more complicated than normally are taken into account.

However, a perhaps bigger problem with current policies for economic and social innovations is the abovementioned fact that the three types of actors have different missions, different core-activities and consequently different norms and values. Innovation policies are normally based on the assumption that the actors of the desired cooperation have a common denominator large enough to motivate investing resources in long-term cooperation. Investment of these resources may in itself be seen as a proof of that common denominator and innovation policies seem to be built on the assumption that the projects strengthen this common denominator automatically. The issue of the cooperating actors' social relations and norms and values are normally not considered in innovation and cluster policies. Instead, these issues are mainly paid attention to in social and welfare (i.e. redistribution) policies. This problem is illustrated by three Swedish examples.

4.2 Three Swedish Examples

VINNOVA, the Swedish agency for innovation systems, was launched 2001 and has an annual budget of approximately $140 000 000. A substantial part of the resources are used in different R&D programs. One of these programs, VINNVÄXT, gives up to 50% support to selected long-term (10 years) regional innovation projects. Among the selection criteria are a couple of factors that can be connected to relations and values: the regional leadership should support renewal and

[7] The post-war Japanese National System of Innovation was according to Johnsson (1982) and Freeman (1987) a successful example of national innovation policies with such direct effects on innovations.

there should exist a shared vision. A fundamental idea for the program is triple helix-cooperation between the three actors: business, government and academy. However, the problems connected to the different missions, norms and values of the three actors are not considered.

In the projects that so far have been supported the perceived common denominator is reflected in the actors' investment of own resources. Apart from investment in the projects' own trademarks and information, there are very few features of relation-building and other activities that can be compared with individual firms' investment in corporate culture. One exception is the project for the biotech cluster in Uppsala, which contains ideas about pub evenings for actors in the biotech sector. The program is simply based on the idea that the common denominator exists, that it is sufficiently strong in itself and that there is no need for particular investment in social relations, joint norms and values for the actors in the projects.

A second example, a Metropolitan Policy Program for deprived urban neighborhoods in the three biggest cities was launched by the Swedish Government in 1998. The overall goals of the policy are to increase the prospects of the Swedish metropolitan regions for long-term sustainable growth, primarily by contributing to new job opportunities, and to stop social, ethnic and discriminatory segregation. In order to achieve these goals, it could be expected that actions for local innovations and entrepreneurship would be taken. However, hardly any such projects have been started. Instead a large number of other projects on a number of areas were launched. A substantial part of the projects was concentrated to issues related to social capital, aiming e.g. on strengthening the cohesion of the neighborhood by changing attitudes and building links between different groups and individuals. Instead of building social capital connected to production, the metropolitan policy has focused on social capital connected to consumption, i.e. peoples' leisure, living and culture. Instead of building links between the deprived neighborhoods and their inhabitants and the rest of the metropolitan regions, activities were mainly concentrated on the pure local neighborhoods.

The third example is the National Delegation for Regional Cooperation on Higher Education, active 2002-2004. The delegation gave economic and supervise support to projects where universities, public sector bodies and companies collaborated on developing new educations, adapted to the regional labor market, but also to more general "platform-building" for possible future collaboration between the three actors. Even if social capital-building was not an explicit aim for the delegation, the official evaluation of the delegation concluded that the delegation in practice supported the forming of new social capital through creating new relations between regional actors. The evaluation found that this implicit aim was successfully fulfilled in many projects, but that there in many cases was a great uncertainty whether the collaboration would continue when the project grants were finished (Westlund, Decaio and Johansson 2005).

The three examples show the dilemma of current sectoral policies: on the one hand growth policies through cluster- and innovation policies, without understanding of the role of social networks, norms and values; on the other hand policies aiming at growth and social equalization through building local social networks and joint norms and values, without understanding the role of innovation, entrepreneurship and the intraregional labor market; on the third hand support for short-term projects without any strategy for how to develop the newly established networks of collaboration.

5 Concluding Remarks

Innovation has become an increasingly complex process with an increasing number of interacting actors involved. One of the things that facilitate this interaction is positive social relations between the actors. In the wake of the emergence of the knowledge economy new theories, as those of

clusters and regional innovation systems, have stressed the region as the spatial level where innovation processes take place.

The actors of the economy mainly form their social capitals themselves. Whereas most actors solely act in accordance with their own needs, government is the only actor that must take the "public interest" into consideration. This means that governmental policies have a central role in the forming and reforming of regions' social capital. This circumstance has so far mainly had an impact on social and welfare policies, but very little influence on policies for economic transformation and growth.

Thus, a conclusion is that research on the social capital of the actors' of innovation would shed new light on critical aspects of these processes. One of these critical aspects is that the three actor blocs of innovation systems and triple helix have different missions and base their activities on different principles. The fact that government already today is launching policies for clusters, innovation systems and triple helix, is in itself a strong argument for such research.

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